

Calendar No. \_\_\_\_\_

106<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

# S. 1066

[Report No. 106-\_\_\_\_]

## IN THE SENATE OF THE UNITED STATES

MAY 18 (legislative day, MAY 14), 1999

Mr. ROBERTS (for himself, Mr. MURKOWSKI, Mr. GRAMS, Mr. HAGEL, Mr. CRAIG, Mr. ENZI, Mr. ALLARD, Mr. BROWNBAC, and Mr. HARKIN) introduced the following bill; which was read twice and referred to the Committee on Agriculture, Nutrition, and Forestry

JULY \_\_\_\_ (legislative day, \_\_\_\_\_), 2000

Reported by Mr. LUGAR, with an amendment

[Strike out all after the enacting clause and insert the part printed in italic]

## A BILL

To amend the National Agricultural Research, Extension, and Teaching Policy Act of 1977 to encourage the use of and research into agricultural best practices to improve the environment, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Carbon Cycle and Ag-  
3 ricultural Best Practices Research Act”.

4 **SEC. 2. FINDINGS.**

5 Congress finds that—

6 (1) agricultural producers in the United  
7 States—

8 (A) have, in good faith, participated in  
9 mandatory and voluntary conservation pro-  
10 grams, the successes of which are unseen by the  
11 general public, to preserve natural resources;  
12 and

13 (B) have a personal stake in ensuring that  
14 the air, water, and soil of the United States are  
15 productive since agricultural productivity di-  
16 rectly affects—

17 (i) the economic success of agricul-  
18 tural producers; and

19 (ii) the production of food and fiber  
20 for developing and developed nations;

21 (2) in addition to providing food and fiber, agri-  
22 culture serves an environmental role by providing  
23 benefits to air, soil, and water through agricultural  
24 best practices;

25 (3) those conservation programs and Federal  
26 land provide the United States with an enormous

1 potential to increase the quantity of carbon stored in  
2 agricultural land and commodities through the car-  
3 bon cycle;

4 (4) according to the Climate Modeling and  
5 Diagnostics Laboratory of the National Oceanic and  
6 Atmospheric Administration, North American soils,  
7 crops, rangelands, and forests absorbed an equiva-  
8 lent quantity of carbon dioxide emitted from fossil  
9 fuel combustion as part of the natural carbon cycle  
10 from 1988 through 1992;

11 (5) the estimated quantity of carbon stored in  
12 world soils is more than twice the carbon in living  
13 vegetation or in the atmosphere;

14 (6) agricultural best practices can increase the  
15 quantity of carbon stored in farm soils, crops, and  
16 rangeland;

17 (7) although there is a tremendous quantity of  
18 carbon stored in soil that supports agricultural oper-  
19 ations in the United States, the quantity of carbon  
20 stored in soil may be increased by using a strategy  
21 that would benefit the environment without imple-  
22 menting a United Nations-sponsored climate change  
23 protocol or treaty;

24 (8) Federal research is needed to identify—

1           (A) the agricultural best practices that  
2 supplement the natural carbon cycle; and

3           (B) Federal conservation programs that  
4 can be altered to increase the environmental  
5 benefits provided by the natural carbon cycle;

6           (9) increasing soil organic carbon is widely rec-  
7 ognized as a means of increasing agricultural pro-  
8 duction and meeting the growing domestic and inter-  
9 national food consumption needs with a positive en-  
10 vironmental benefit;

11           (10) agricultural best practices include the  
12 more efficient use of agriculture inputs and equip-  
13 ment; and

14           (11) tax credits should be offered in order to  
15 facilitate the widespread use of more efficient agri-  
16 culture inputs and equipment and to increase envi-  
17 ronmental benefits.

18 **SEC. 3. AGRICULTURAL BEST PRACTICES.**

19           Title XIV of the National Agricultural Research, Ex-  
20 tension, and Teaching Policy Act of 1977 (7 U.S.C. 3101  
21 et seq.) is amended by adding at the end the following:

22           **“Subtitle N—Carbon Cycle and**  
23           **Agricultural Best Practices**

24           **“SEC. 1490. DEFINITIONS.**

25           “In this subtitle:

1           “(1) AGRICULTURAL BEST PRACTICE.—The  
2 term ‘agricultural best practice’ means a voluntary  
3 practice used by 1 or more agricultural producers to  
4 manage a farm or ranch that has a beneficial or  
5 minimal impact on the environment, including—

6           “(A) crop residue management;

7           “(B) soil erosion management;

8           “(C) nutrient management;

9           “(D) remote sensing;

10          “(E) precision agriculture;

11          “(F) integrated pest management;

12          “(G) animal waste management;

13          “(H) cover crop management;

14          “(I) water quality and utilization manage-  
15 ment;

16          “(J) grazing and range management;

17          “(K) wetland management;

18          “(L) buffer strip use; and

19          “(M) tree planting.

20          “(2) CONSERVATION PROGRAM.—The term  
21 ‘conservation program’ means a program established  
22 under—

23                 “(A) subtitle D of title XII of the Food Se-  
24 curity Act of 1985 (16 U.S.C. 3830 et seq.);

1           “(B) section 401 or 402 of the Agricul-  
2 tural Credit Act of 1978 (16 U.S.C. 2201,  
3 2202);

4           “(C) section 3 or 8 of the Watershed Pro-  
5 tection and Flood Prevention Act (16 U.S.C.  
6 1003, 1006a); or

7           “(D) any other provision of law that au-  
8 thorizes the Secretary to make payments or  
9 provide other assistance to agricultural pro-  
10 ducers to promote conservation.

11 **“SEC. 1491. CARBON CYCLE AND AGRICULTURAL BEST**  
12 **PRACTICES RESEARCH.**

13           “(a) IN GENERAL.—The Department of Agriculture  
14 shall be the lead agency with respect to any agricultural  
15 soil carbon research conducted by the Federal Govern-  
16 ment.

17           “(b) RESEARCH SERVICES.—

18           “(1) AGRICULTURAL RESEARCH SERVICE.—The  
19 Secretary, acting through the Agricultural Research  
20 Service, shall collaborate with other Federal agencies  
21 to develop data and conduct research addressing soil  
22 carbon balance and storage, making special efforts  
23 to—

1           “(A) determine the effects of management  
2           and conservation on carbon storage in cropland  
3           and grazing land;

4           “(B) evaluate the long-term impact of till-  
5           age and residue management systems on the  
6           accumulation of organic carbon;

7           “(C) study the transfer of organic carbon  
8           to soil; and

9           “(D) study carbon storage of commodities.

10          “(2) NATURAL RESOURCES CONSERVATION  
11          SERVICE.—

12           “(A) RESEARCH MISSIONS.—The research  
13           missions of the Secretary, acting through the  
14           Natural Resources Conservation Service,  
15           include—

16           “(i) the development of a soil carbon  
17           database to—

18           “(I) provide online access to in-  
19           formation about soil carbon potential  
20           in a format that facilitates the use of  
21           the database in making land manage-  
22           ment decisions; and

23           “(II) allow additional and more  
24           refined data to be linked to similar

1 databases containing information on  
2 forests and rangeland;

3 “(ii) the conversion to an electronic  
4 format and linkage to the national soil  
5 database described in clause (i) of county-  
6 level soil surveys and State-level soil maps;

7 “(iii) updating of State-level soil  
8 maps;

9 “(iv) the linkage, for information pur-  
10 poses only, of soil information to other soil  
11 and land use databases; and

12 “(v) the completion of evaluations,  
13 such as field validation and calibration, of  
14 modeling, remote sensing, and statistical  
15 inventory approaches to carbon stock as-  
16 sessments related to land management  
17 practices and agronomic systems at the  
18 field, regional, and national levels.

19 “(B) UNIT OF INFORMATION.—The Sec-  
20 retary, acting through the Natural Resources  
21 Conservation Service, shall disseminate a na-  
22 tional basic unit of information for an assess-  
23 ment of the carbon storage potential of soils in  
24 the United States.

1           ~~“(3) ECONOMIC RESEARCH SERVICE REPORT.—~~  
2           ~~Not later than 1 year after the date of enactment~~  
3           ~~of this section, the Secretary, acting through the~~  
4           ~~Economic Research Service, shall submit to the~~  
5           ~~Committee on Agriculture of the House of Rep-~~  
6           ~~resentatives and the Committee on Agriculture, Nu-~~  
7           ~~trition, and Forestry of the Senate a report that~~  
8           ~~analyzes the impact of the financial health of the~~  
9           ~~farm economy of the United States under the Kyoto~~  
10           ~~Protocol and other international agreements under~~  
11           ~~the Framework Convention on Climate Change—~~

12                   ~~“(A) with and without market mechanisms~~  
13                   ~~(including whether the mechanisms are permits~~  
14                   ~~for emissions and whether the permits are~~  
15                   ~~issued by allocation, auction, or otherwise);~~

16                   ~~“(B) with and without the participation of~~  
17                   ~~developing countries;~~

18                   ~~“(C) with and without carbon sinks; and~~

19                   ~~“(D) with respect to the imposition of tra-~~  
20                   ~~ditional command and control measures.~~

21           ~~“(e) CONSORTIA.—~~

22                   ~~“(1) IN GENERAL.—The Secretary may des-~~  
23                   ~~ignate not more than 2 carbon cycle and agricultural~~  
24                   ~~best practices research consortia.~~

1           “(2) SELECTION.—The consortia designated by  
2 the Secretary shall be selected in a competitive man-  
3 ner by the Cooperative State Research, Education,  
4 and Extension Service.

5           “(3) DUTIES.—The consortia shall—

6           “(A) identify, develop, and evaluate agri-  
7 cultural best practices using partnerships com-  
8 posed of Federal, State, or private entities and  
9 the Department of Agriculture, including the  
10 Agricultural Research Service;

11           “(B) develop necessary computer models to  
12 predict and assess the carbon cycle, as well as  
13 other priorities requested by the Secretary and  
14 the heads of other Federal agencies;

15           “(C) estimate and develop mechanisms to  
16 measure carbon levels made available as a re-  
17 sult of voluntary Federal conservation pro-  
18 grams, private and Federal forests, and other  
19 land uses; and

20           “(D) develop outreach programs, in coordi-  
21 nation with extension services, to share infor-  
22 mation on carbon cycle and agricultural best  
23 practices that is useful to agricultural pro-  
24 ducers.

1           “(4) CONSORTIA PARTICIPANTS.—The partici-  
2           pants in the consortia may include—

3                   “(A) land-grant colleges and universities;

4                   “(B) State geological surveys;

5                   “(C) research centers of the National Aer-  
6           onautics and Space Administration;

7                   “(D) other Federal agencies;

8                   “(E) representatives of agricultural busi-  
9           nesses and organizations; and

10                  “(F) representatives of the private sector.

11           “(5) AUTHORIZATION OF APPROPRIATIONS.—

12           There are authorized to be appropriated to carry out  
13           this subsection \$5,000,000 for each of fiscal years  
14           2000 through 2002.

15           “(d) PROMOTION OF AGRICULTURAL BEST PRAC-  
16           TICES.—The Secretary shall promote voluntary agricul-  
17           tural best practices that take into account soil organic  
18           matter dynamics, carbon cycle, ecology, and soil organisms  
19           that will lead to the more effective use of soil resources  
20           to—

21                   “(1) enhance the carbon cycle;

22                   “(2) improve soil quality;

23                   “(3) increase the use of renewable resources;

24           and

1           “(4) overcome unfavorable physical soil prop-  
2           erties:

3           “(e) ANNUAL REPORT.—The Secretary shall submit  
4 to the Committee on Agriculture of the House of Rep-  
5 resentatives and the Committee on Agriculture, Nutrition,  
6 and Forestry of the Senate an annual report that de-  
7 scribes programs that are or will be conducted by the Sec-  
8 retary, through land-grant colleges and universities, to  
9 provide to agricultural producers the results of research  
10 conducted on agricultural best practices, including the re-  
11 sults of—

12           “(1) research;

13           “(2) future research plans;

14           “(3) consultations with appropriate scientific  
15 organizations;

16           “(4) proposed extension outreach activities; and

17           “(5) findings of scientific peer review under sec-  
18 tion 103(d)(1) of the Agricultural Research, Exten-  
19 sion, and Education Reform Act of 1998 (7 U.S.C.  
20 7613(d)(1)).

21 **“SEC. 1492. CARBON CYCLE REMOTE SENSING TECH-**  
22 **NOLOGY.**

23           “(a) CARBON CYCLE REMOTE SENSING TECH-  
24 NOLOGY PROGRAM.—

1           “(1) IN GENERAL.—The Secretary, in coopera-  
2           tion with the Administrator of the National Aero-  
3           nautics and Space Administration, shall develop a  
4           carbon cycle remote sensing technology program—

5                   “(A) to provide, on a near-continual basis,  
6                   a real-time and comprehensive view of vegeta-  
7                   tion conditions; and

8                   “(B) to assess and model agricultural car-  
9                   bon sequestration.

10           “(2) USE OF CENTERS.—The Administrator of  
11           the National Aeronautics and Space Administration  
12           shall use regional earth science application centers  
13           to conduct research under this section.

14           “(3) RESEARCHED AREAS.—The areas that  
15           shall be the subjects of research conducted under  
16           this section include—

17                   “(A) the mapping of carbon-sequestering  
18                   land use and land cover;

19                   “(B) the monitoring of changes in land  
20                   cover and management;

21                   “(C) new systems for the remote sensing  
22                   of soil carbon; and

23                   “(D) regional-scale carbon sequestration  
24                   estimation.

1       “(b) REGIONAL EARTH SCIENCE APPLICATION CEN-  
2 TER.—

3           “(1) IN GENERAL.—The Secretary, in coopera-  
4 tion with the Administrator of the National Aero-  
5 nautics and Space Administration, shall carry out  
6 this section through the Regional Earth Science Ap-  
7 plication Center located at the University of Kansas  
8 (referred to in this section as the ‘Center’), if the  
9 Center enters into a partnership with a land-grant  
10 college or university.

11          “(2) DUTIES OF CENTER.—The Center shall  
12 serve as a research facility and clearinghouse for  
13 satellite data, software, research, and related infor-  
14 mation with respect to remote sensing research con-  
15 ducted under this section.

16          “(3) USE OF CENTER.—The Secretary, in co-  
17 operation with the Administrator of the National  
18 Aeronautics and Space Administration, shall use the  
19 Center for carrying out remote sensing research re-  
20 lating to agricultural best practices.

21          “(c) AUTHORIZATION OF APPROPRIATIONS.—There  
22 is authorized to be appropriated to carry out this section  
23 \$5,000,000 for fiscal years 2000 through 2002.

1 **“SEC. 1493. CONSERVATION PREMIUM PAYMENTS.**

2 “In addition to payments that are made by the Sec-  
3 retary to producers under conservation programs, the Sec-  
4 retary may offer conservation premium payments to pro-  
5 ducers that are participating in the conservation programs  
6 to compensate the producers for allowing researchers to  
7 scientifically analyze, and collect information with respect  
8 to, agricultural best practices that are carried out by the  
9 producers as part of conservation projects and activities  
10 that are funded, in whole or in part, by the Federal Gov-  
11 ernment.

12 **“SEC. 1494. ASSISTANCE FOR AGRICULTURAL BEST PRAC-**  
13 **TICES AND NATURAL RESOURCE MANAGE-**  
14 **MENT PLANS UNDER CONSERVATION PRO-**  
15 **GRAMS.**

16 “(a) IN GENERAL.—In addition to assistance that is  
17 provided by the Secretary to producers under conservation  
18 programs, the Secretary, on request of the producers, shall  
19 provide education through extension activities and tech-  
20 nical and financial assistance to producers that are par-  
21 ticipating in the conservation programs to assist the pro-  
22 ducers in planning, designing, and installing agricultural  
23 best practices and natural resource management plans es-  
24 tablished under the conservation programs.

25 “(b) INFORMATION TO DEVELOPING NATIONS.—The  
26 Secretary shall disseminate to developing nations informa-

1 tion on agricultural best practices and natural resource  
2 management plans that—

3           “(1) provide crucial agricultural benefits for soil  
4           and water quality; and

5           “(2) increase production.

6 **“SEC. 1495. CARBON CYCLE RESEARCH MONITORING SYS-**  
7 **TEM.**

8           “(a) ESTABLISHMENT.—The Secretary, in conjunc-  
9 tion with the Administrator of the National Oceanic and  
10 Atmospheric Administration and the United States Global  
11 Change Research Program, may establish a nationwide  
12 carbon cycle monitoring system (referred to in this section  
13 as the ‘monitoring system’) to research the flux of carbon  
14 between soil, air, and water.

15           “(b) PURPOSE OF SYSTEM.—The monitoring system  
16 shall focus on locating network monitors on or near agri-  
17 cultural best practices that are—

18           “(1) undertaken voluntarily;

19           “(2) undertaken through a conservation pro-  
20 gram of the Department of Agriculture;

21           “(3) implemented as part of a program or ac-  
22 tivity of the Department of Agriculture; or

23           “(4) identified by the Administrator of the Na-  
24 tional Oceanic and Atmospheric Administration.

1       “(c) ~~MEMORANDUM OF UNDERSTANDING.~~—The Sec-  
2 retary may enter into a memorandum of understanding  
3 with the Administrator of the National Oceanic and At-  
4 mospheric Administration to ensure that research goals of  
5 programs established by the Federal Government related  
6 to carbon monitoring are met through the monitoring sys-  
7 tem.

8       “(d) ~~AUTHORIZATION OF APPROPRIATIONS.~~—There  
9 is authorized to be appropriated to carry out this subtitle  
10 \$10,000,000.”.

11 **SECTION 1. SHORT TITLE.**

12       *This Act may be cited as the “Carbon Cycle and Agri-  
13 cultural Best Practices Research Act”.*

14 **SEC. 2. FINDINGS.**

15       *Congress finds that—*

16           (1) *agricultural producers in the United  
17 States—*

18               (A) *have, in good faith, participated in  
19 mandatory and voluntary conservation pro-  
20 grams, the successes of which are unseen by the  
21 general public, to preserve natural resources; and*

22               (B) *have a personal stake in ensuring that  
23 the air, water, and soil of the United States are  
24 productive since agricultural productivity di-  
25 rectly affects—*

1                   (i) the economic success of agricultural  
2                   producers; and

3                   (ii) the production of food and fiber for  
4                   developing and developed nations;

5                   (2) in addition to providing food and fiber, agri-  
6                   culture serves an environmental role by providing  
7                   benefits to air, soil, and water through agricultural  
8                   best practices;

9                   (3) agricultural best practices include the more  
10                  efficient use of agriculture inputs and equipment;

11                  (4)(A) agricultural best practices accentuate the  
12                  carbon cycle by increasing the conversion of carbon  
13                  dioxide from the air into plants that produce grain  
14                  and forage;

15                  (B) at the end of the growing season, plant mate-  
16                  rial decomposes, adding carbon to soil;

17                  (C) carbon can persist in soil for hundreds and  
18                  even thousands of years; and

19                  (D) through conservation practices, the addi-  
20                  tional carbon in soil results in multiple environ-  
21                  mental benefits, erosion reduction, moisture retention,  
22                  water quality improvements, and increased crop  
23                  yields;

24                  (5) according to the Climate Monitoring and  
25                  Diagnostics Laboratory of the National Oceanic and

1     *Atmospheric Administration, North American soils,*  
2     *crops, rangelands, and forests absorbed an equivalent*  
3     *quantity of carbon dioxide emitted from fossil fuel*  
4     *combustion as part of the natural carbon cycle from*  
5     *1988 through 1992;*

6             *(6) the estimated quantity of carbon stored in*  
7     *world soils is more than twice the carbon in living*  
8     *vegetation or in the atmosphere;*

9             *(7) agricultural best practices can increase the*  
10    *quantity of carbon stored in farm soils, crops, and*  
11    *rangeland;*

12            *(8) by increasing use of voluntary agricultural*  
13    *best practices, it is possible to offset carbon dioxide*  
14    *emissions, thereby benefiting the environment, without*  
15    *implementing a United Nations-sponsored climate*  
16    *change protocol or treaty;*

17            *(9) Federal research is needed to identify—*

18                 *(A) the agricultural best practices that sup-*  
19    *plement the natural carbon cycle; and*

20                 *(B) Federal conservation programs that can*  
21    *be altered to increase the environmental benefits*  
22    *provided by the natural carbon cycle; and*

23            *(10) increasing soil organic carbon is widely rec-*  
24    *ognized as a means of increasing agricultural produc-*  
25    *tion and meeting the growing domestic and inter-*

1       *national food consumption needs with a positive envi-*  
2       *ronmental benefit.*

3   **SEC. 3. AGRICULTURAL BEST PRACTICES.**

4       *Title XIV of the National Agricultural Research, Ex-*  
5       *tension, and Teaching Policy Act of 1977 (7 U.S.C. 3101*  
6       *et seq.) is amended by adding at the end the following:*

7       **“Subtitle N—Carbon Cycle and**  
8       **Agricultural Best Practices**

9   **“SEC. 1490. DEFINITIONS.**

10       *“In this subtitle:*

11               *“(1) AGRICULTURAL BEST PRACTICE.—The term*  
12       *‘agricultural best practice’ means a voluntary prac-*  
13       *tice used by 1 or more agricultural producers to man-*  
14       *age a farm or ranch that has a beneficial or minimal*  
15       *impact on the environment, including—*

16                       *“(A) crop residue management;*

17                       *“(B) soil erosion management;*

18                       *“(C) nutrient management;*

19                       *“(D) remote sensing;*

20                       *“(E) precision agriculture;*

21                       *“(F) integrated pest management;*

22                       *“(G) animal waste management;*

23                       *“(H) cover crop management;*

24                       *“(I) water quality and utilization manage-*  
25       *ment;*

1                   “(J) grazing and range management;

2                   “(K) wetland management;

3                   “(L) buffer strip use; and

4                   “(M) tree planting.

5                   “(2) CONSERVATION PROGRAM.—The term ‘con-

6                   serva-tion program’ means a program established

7                   under—

8                   “(A) subtitle D of title XII of the Food Se-

9                   curity Act of 1985 (16 U.S.C. 3830 et seq.);

10                   “(B) section 401 or 402 of the Agricultural

11                   Credit Act of 1978 (16 U.S.C. 2201, 2202);

12                   “(C) section 3 or 8 of the Watershed Protec-

13                   tion and Flood Prevention Act (16 U.S.C. 1003,

14                   1006a); or

15                   “(D) any other provision of law that au-

16                   thorizes the Secretary to make payments or pro-

17                   vide other assistance to agricultural producers to

18                   promote conserva-tion.

19                   **“SEC. 1491. CARBON CYCLE AND AGRICULTURAL BEST**

20                   **PRACTICES RESEARCH.**

21                   “(a) IN GENERAL.—The Department of Agriculture

22                   shall be the lead agency with respect to any agricultural

23                   soil carbon research conducted by the Federal Government.

24                   “(b) RESEARCH SERVICES.—

1           “(1) *AGRICULTURAL RESEARCH SERVICE.—The*  
2           *Secretary, acting through the Agricultural Research*  
3           *Service, shall collaborate with other Federal agencies*  
4           *to develop data and conduct research addressing soil*  
5           *carbon balance and storage, making special efforts*  
6           *to—*

7                   “(A) *determine the effects of management*  
8                   *and conservation on soil organic carbon storage*  
9                   *in cropland and grazing land;*

10                   “(B) *evaluate the long-term impact of till-*  
11                   *age and residue management systems on the ac-*  
12                   *cumulation of organic carbon;*

13                   “(C) *study the transfer of organic carbon to*  
14                   *soil; and*

15                   “(D) *study carbon storage of commodities.*

16           “(2) *NATURAL RESOURCES CONSERVATION SERV-*  
17           *ICE.—*

18                   “(A) *RESEARCH MISSIONS.—The research*  
19                   *missions of the Secretary, acting through the*  
20                   *Natural Resources Conservation Service,*  
21                   *include—*

22                           “(i) *the development of a soil carbon*  
23                           *database to—*

24                                   “(I) *provide online access to infor-*  
25                                   *mation about soil carbon potential in*

1                    *a format that facilitates the use of the*  
2                    *database in making land management*  
3                    *decisions; and*

4                    *“(II) allow additional and more*  
5                    *refined data to be linked to similar*  
6                    *databases containing information on*  
7                    *forests and rangeland;*

8                    *“(ii) the conversion to an electronic*  
9                    *format and linkage to the national soil*  
10                   *database described in clause (i) of county-*  
11                   *level soil surveys and State-level soil maps;*

12                   *“(iii) updating of State-level soil*  
13                   *maps;*

14                   *“(iv) the linkage, for information pur-*  
15                   *poses only, of soil information to other soil*  
16                   *and land use databases; and*

17                   *“(v) the completion of evaluations,*  
18                   *such as field validation and calibration, of*  
19                   *modeling, remote sensing, and statistical in-*  
20                   *ventory approaches to carbon stock assess-*  
21                   *ments related to land management practices*  
22                   *and agronomic systems at the field, re-*  
23                   *gional, and national levels.*

24                   *“(B) UNIT OF INFORMATION.—The Sec-*  
25                   *retary, acting through the Natural Resources*

1           *Conservation Service, shall disseminate a na-*  
2           *tional basic unit of information for an assess-*  
3           *ment of the carbon storage potential of soils in*  
4           *the United States.*

5           “(3) *ECONOMIC RESEARCH SERVICE REPORT.—*  
6           *Not later than 1 year after the date of enactment of*  
7           *this section, the Secretary, acting through the Eco-*  
8           *nomics Research Service, shall submit to the Com-*  
9           *mittee on Agriculture of the House of Representatives*  
10          *and the Committee on Agriculture, Nutrition, and*  
11          *Forestry of the Senate a report that analyzes the im-*  
12          *portance of the financial health of the farm economy of*  
13          *the United States under the Kyoto Protocol and other*  
14          *international agreements under the Framework Con-*  
15          *vention on Climate Change—*

16                 “(A) *with and without market mechanisms*  
17                 *(including whether the mechanisms are permits*  
18                 *for emissions and whether the permits are issued*  
19                 *by allocation, auction, or otherwise);*

20                 “(B) *with and without the participation of*  
21                 *developing countries;*

22                 “(C) *with and without carbon sinks; and*

23                 “(D) *with respect to the imposition of tradi-*  
24                 *tional command and control measures.*

1           “(4) *COOPERATIVE STATE RESEARCH, EDU-*  
2           *CATION, AND EXTENSION SERVICE.—*

3           “(A) *IN GENERAL.—The Cooperative State*  
4           *Research, Education, and Extension Service*  
5           *shall, through land-grant colleges and univer-*  
6           *sities, develop a comprehensive national carbon*  
7           *cycle and agricultural best practices research*  
8           *agenda.*

9           “(B) *RESEARCH MISSIONS.—The research*  
10           *missions of the Secretary, acting through the Co-*  
11           *operative State Research, Education, and Exten-*  
12           *sion Service, include the provision, through land-*  
13           *grant colleges and universities, of research oppor-*  
14           *tunities to improve the scientific basis for using*  
15           *land management practices to increase soil car-*  
16           *bon sequestration needed for producers, including*  
17           *research concerning innovative methods of using*  
18           *biotechnology and nanotechnology.*

19           “(C) *ACTIVITIES.—The Secretary, acting*  
20           *through the Cooperative State Research, Edu-*  
21           *cation, and Extension Service, shall—*

22           “(i) *identify, develop, and evaluate ag-*  
23           *ricultural best practices using partnerships*  
24           *comprised of Federal, State, or private enti-*

1 *ties and the Department of Agriculture, in-*  
2 *cluding the Agricultural Research Service;*

3 *“(ii) develop necessary computer mod-*  
4 *els to predict and assess the carbon cycle, as*  
5 *well as other priorities requested by the Sec-*  
6 *retary and the heads of other Federal agen-*  
7 *cies;*

8 *“(iii) estimate and develop mecha-*  
9 *nisms to measure changes in carbon levels*  
10 *resulting from voluntary Federal conserva-*  
11 *tion programs, private and Federal forests,*  
12 *and other land uses;*

13 *“(iv) develop outreach programs, in co-*  
14 *ordination with cooperative extension serv-*  
15 *ices, to share information on carbon cycles*  
16 *and agricultural best practices that is useful*  
17 *to agricultural producers; and*

18 *“(v) research new technologies that*  
19 *may increase carbon cycle effectiveness, such*  
20 *as biotechnology and nanotechnology.*

21 *“(c) CONSORTIA.—*

22 *“(1) IN GENERAL.—The Secretary may designate*  
23 *not more than 2 carbon cycle and agricultural best*  
24 *practices research consortia to carry out this section.*

1           “(2) *SELECTION.*—*The consortia designated by*  
2           *the Secretary shall be selected in a competitive man-*  
3           *ner by the Cooperative State Research, Education,*  
4           *and Extension Service.*

5           “(3) *CONSORTIA PARTICIPANTS.*—*The partici-*  
6           *pants in the consortia may include—*

7                   “(A) *land-grant colleges and universities;*

8                   “(B) *State geological surveys;*

9                   “(C) *research centers of the National Aero-*  
10           *navics and Space Administration;*

11                   “(D) *other Federal agencies;*

12                   “(E) *representatives of agricultural busi-*  
13           *nesses and organizations; and*

14                   “(F) *representatives of the private sector.*

15           “(4) *AUTHORIZATION OF APPROPRIATIONS.*—  
16           *There are authorized to be appropriated to carry out*  
17           *this subsection \$5,000,000 for each of fiscal years*  
18           *2001 through 2005.*

19           “(d) *PROMOTION OF AGRICULTURAL BEST PRAC-*  
20           *TICES.*—*The Secretary shall promote voluntary agricul-*  
21           *tural best practices that take into account soil organic mat-*  
22           *ter dynamics, carbon cycle, ecology, and soil organisms that*  
23           *will lead to the more effective use of soil resources to—*

24                   “(1) *enhance the carbon cycle;*

25                   “(2) *improve soil quality;*

1           “(3) *increase the use of renewable resources; and*  
2           “(4) *overcome unfavorable physical soil prop-*  
3           *erties.*

4           “(e) *ANNUAL REPORT.—The Secretary shall submit to*  
5           *the Committee on Agriculture of the House of Representa-*  
6           *tives and the Committee on Agriculture, Nutrition, and*  
7           *Forestry of the Senate an annual report that describes pro-*  
8           *grams that are or will be conducted by the Secretary,*  
9           *through land-grant colleges and universities, to provide to*  
10           *agricultural producers the results of research conducted on*  
11           *agricultural best practices, including the results of—*

12           “(1) *research;*

13           “(2) *future research plans;*

14           “(3) *consultations with appropriate scientific or-*  
15           *ganizations;*

16           “(4) *proposed extension outreach activities; and*

17           “(5) *findings of scientific peer review under sec-*  
18           *tion 103(d)(1) of the Agricultural Research, Exten-*  
19           *sion, and Education Reform Act of 1998 (7 U.S.C.*  
20           *7613(d)(1)).*

21           **“SEC. 1492. CARBON CYCLE REMOTE SENSING TECH-**  
22           **NOLOGY.**

23           “(a) *IN GENERAL.—The Secretary, in cooperation*  
24           *with the Administrator of the National Aeronautics and*

1 *Space Administration, shall develop a carbon cycle remote*  
2 *sensing technology program—*

3           “(1) *to provide, on a near-continual basis, a*  
4 *real-time and comprehensive view of vegetation condi-*  
5 *tions; and*

6           “(2) *to assess and model agricultural carbon se-*  
7 *questration.*

8           “(b) *USE OF CENTERS.—The Administrator of the Na-*  
9 *tional Aeronautics and Space Administration shall use re-*  
10 *gional earth science application centers to conduct research*  
11 *under this section.*

12           “(c) *RESEARCHED AREAS.—The areas that shall be the*  
13 *subjects of research conducted under this section include—*

14           “(1) *the mapping of carbon-sequestering land use*  
15 *and land cover;*

16           “(2) *the monitoring of changes in land cover and*  
17 *management;*

18           “(3) *new systems for the remote sensing of soil*  
19 *carbon; and*

20           “(4) *regional-scale carbon sequestration esti-*  
21 *mation.*

22           “(d) *AUTHORIZATION OF APPROPRIATIONS.—There is*  
23 *authorized to be appropriated to carry out this section*  
24 *\$5,000,000 for each of fiscal years 2001 through 2005.*

1 **“SEC. 1493. RESEARCH INCENTIVE PAYMENTS.**

2       “(a) *IN GENERAL.*—*In addition to payments that are*  
3 *made by the Secretary to producers under conservation pro-*  
4 *grams, the Secretary may, subject to appropriations author-*  
5 *ized in subsection (c), offer research incentive payments to*  
6 *producers that are participating in the conservation pro-*  
7 *grams to compensate the producers for allowing researchers*  
8 *to scientifically analyze, and collect information with re-*  
9 *spect to, agricultural best practices that are carried out by*  
10 *the producers as part of conservation projects and activities*  
11 *that are funded, in whole or in part, by the Federal Govern-*  
12 *ment.*

13       “(b) *CONFIDENTIALITY.*—

14               “(1) *IN GENERAL.*—*Except as provided in para-*  
15 *graph (2), any information submitted to the Sec-*  
16 *retary under subsection (a) shall be confidential and*  
17 *may be disclosed only if required under court order.*

18               “(2) *RELEASE OF INFORMATION IN AGGREGATE*  
19 *FORM.*—*The Secretary may release or make public in-*  
20 *formation described in paragraph (1) in an aggregate*  
21 *or summary form that does not directly disclose the*  
22 *identity, business transactions, or trade secrets of any*  
23 *person that submits the information.*

24       “(c) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*  
25 *authorized to be appropriated such sums as are necessary*

1 *to carry out this section for each of fiscal years 2001*  
2 *through 2005.*

3 **“SEC. 1494. ASSISTANCE FOR AGRICULTURAL BEST PRAC-**  
4 **TICES AND NATURAL RESOURCE MANAGE-**  
5 **MENT PLANS UNDER CONSERVATION PRO-**  
6 **GRAMS.**

7 *“(a) IN GENERAL.—In addition to assistance that is*  
8 *provided by the Secretary to producers under conservation*  
9 *programs, the Secretary, on request of the producers, shall*  
10 *provide, subject to appropriations authorized in subsection*  
11 *(c), education through extension activities and technical as-*  
12 *sistance to producers that are participating in the conserva-*  
13 *tion programs to assist the producers in planning, design-*  
14 *ing, and installing agricultural best practices and natural*  
15 *resource management plans established under the conserva-*  
16 *tion programs.*

17 *“(b) INFORMATION TO DEVELOPING NATIONS.—The*  
18 *Secretary shall disseminate to developing nations informa-*  
19 *tion on agricultural best practices and natural resource*  
20 *management plans that—*

21 *“(1) provide crucial agricultural benefits for soil*  
22 *and water quality; and*

23 *“(2) increase production.*

24 *“(c) AUTHORIZATION OF APPROPRIATIONS.—There are*  
25 *authorized to be appropriated such sums as are necessary*

1 *to carry out this section for each of fiscal years 2001*  
2 *through 2005.*

3 **“SEC. 1495. TRACE GAS NETWORK SYSTEM.**

4       “(a) *ESTABLISHMENT.—The Secretary, in conjunction*  
5 *with the Administrator of the National Oceanic and Atmos-*  
6 *pheric Administration, may establish a nationwide trace*  
7 *gas network system to research the flux of carbon between*  
8 *soil, air, and water.*

9       “(b) *PURPOSE OF SYSTEM.—The trace gas network*  
10 *system shall focus on locating appropriate research equip-*  
11 *ment on or near agricultural best practices that are—*

12               “(1) *undertaken voluntarily;*

13               “(2) *undertaken through a conservation program*  
14 *of the Department of Agriculture;*

15               “(3) *implemented as part of a program or activ-*  
16 *ity of the Department of Agriculture; or*

17               “(4) *identified by the Administrator of the Na-*  
18 *tional Oceanic and Atmospheric Administration.*

19       “(c) *MEMORANDUM OF UNDERSTANDING.—The Sec-*  
20 *retary may enter into a memorandum of understanding*  
21 *with the Administrator of the National Oceanic and Atmos-*  
22 *pheric Administration to ensure that research goals of pro-*  
23 *grams established by the Federal Government relating to*  
24 *trace gas research are met through the trace gas network*  
25 *system.*

1           “(d) *AUTHORIZATION OF APPROPRIATIONS.—There is*  
2 *authorized to be appropriated to carry out this section*  
3 *\$10,000,000.”.*